

## **DRAFT MEETING SUMMARY (v.2)**

*DRAFT - NOT APPROVED BY COMMITTEE*

### **HANFORD ADVISORY BOARD**

#### **TANK WASTE COMMITTEE**

*July 17, 2002*

*Richland, WA*

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*This is only a summary of issues and actions in this meeting. It may not represent the fullness of ideas discussed or opinions given, and should not be used as a substitute for actual public involvement or public comment on any particular topic unless specifically identified as such.*

#### **Introduction**

Doug Huston, Committee Chair, opened the meeting and invited attendees to introduce themselves.

#### **Cleanup Constraints and Challenges Team (C3T)/Performance Management Plan (PMP) and Their Relationship to Tanks**

Steve Wiegman, Department of Energy – Office of River Protection (DOE-ORP), told the committee that the draft PMP would be sent to Assistant Secretary of Energy Jessie Roberson today. The goal is to issue the final document on August 1<sup>st</sup>.

The State of Washington has petitioned to receive Friend of the Court status in a lawsuit filed by the Snake River Alliance, Natural Resource Defense Council, and some of the Tribal Nations against DOE regarding leaving waste in tanks. This means the State does not think either party in the case represents the State's interests; however, this move paves the way for other interested parties to get involved with the lawsuit. The State's petition is not affecting day-to-day communications between the Department of Ecology (Ecology) and DOE on the PMP.

#### ***C3T Overview***

C3T identified three initiatives related to tanks that the committee asked to be briefed on:

- Supplemental treatment technologies

- Early tank closures
- Increased throughput for the vitrification plant

The purpose of looking at these technologies is to shorten the length of the mission. Any technologies used would have to have a reasonable path forward through the permitting process. A report will be out very soon on the rankings and criteria for these alternatives. The performance outcomes have not been determined in the laboratory yet, and life cycle costs have not been determined.

Steve Wiegman would like help from the Hanford Advisory Board (Board) and the River and Plateau committee in giving a policy-level reaction on issues like the need for greater volume disposal and the amount of waste left on the site versus shipped away. He needs help to portray the policy issues accurately for the public. The report soon to be issued will help the Board and committee do that.

### ***Supplemental Treatment Technologies***

Bill Hewitt, DOE-ORP, discussed four types of supplemental treatment technologies to immobilize low-level waste that are being looked in the C3T process. None of these alternatives makes the plant itself more capable. Bill pointed out that the 2028 date for vitrification cannot be met with the plant as it is currently designed.

Steam reforming. Steam reforming is well suited to high sulfate waste because it breaks down organic compounds into elemental species, treats Resource Conservation and Recovery Act (RCRA) wastes in waste streams, and produces a waste form at the end. The end waste form currently being discussed is sodium aluminum, which has good properties as a waste form.

Sulfur removal. Sulfur removal increases the waste load in the low-level waste glass and allows more waste to go into the glass.

Containerized grout. This grout technology differs from the grout options first proposed ten years ago. The grout would go into containers and be disposed of in RCRA cells on site. Waste would be pretreated to take out cesium, technetium, and other elements. The grout would immobilize the remaining chemicals. The radionuclides would be removed first and taken to the plant for treatment.

The remaining elements with less mobility or shorter lives can be put into lesser waste forms in smaller containers that can be handled if there is a container failure. The waste form would have to pass the performance assessment criteria. The containers would be customized for the type of waste being treated. The volume of grout with this method is less than what was being looked at ten years ago.

Bulk vitrification. Bulk vitrification places waste into a container 20 to 30 meters wide, then vitrifies it. The whole container is disposed of in a RCRA-compliant trench. This process has been used successfully in Japan and Australia for hazardous waste. Bulk

vitrification could offer advantages with some of the high sulfur waste that damages the melters.

These four alternatives were selected from a longer list of potential technologies for evaluation and were endorsed by C3T. Tests will be done with actual tank waste to see if they will work on the type of waste at Hanford. After testing, the best alternatives will go into a pilot program and be deployed. Steam reforming would be housed in the Waste Treatment Plant; the other technologies would be in a separate facility near the tank farms for use with high sulfate waste in single-shell tanks.

Steve Wiegman said these alternatives are described in the PMP. If Jessie Roberson endorses the plan, the contracts and baseline will be modified for 2003 to include the test work.

### ***Discussion***

- Would more land be used for RCRA burial than is currently permitted and identified? There are no engineering plans to site another facility because no alternative has been selected. A fact sheet will be coming out this week on the Supplemental Environmental Impact Statement (EIS) for low-level waste. Any new plans would require more NEPA process.
- Is this taking money away from cleanup? \$200,000 has been designated to study steam reforming waste product before any further studies are done, but this money is not coming out of the cleanup budget. Requests for Proposals have been put out by CH2MHill Hanford Group (CHG) for work on analyzing the other three technologies, but those are not funded. By the end of this year, there will be a new target baseline with preliminary costs and benefits of these technologies.
- Have these technologies been evaluated before? Steam reforming was studied, but the Tank Waste Remediation System (TWRS) EIS chose not to use it. Grout was studied in a different context. Bulk vitrification was not available when other studies were done. When the TWRS EIS was done, they were looking for one technology that could treat everything. The diversity of the waste prompted the look at waste-specific technologies. Using a combination of technologies may reduce the overall volume of waste products.
- Preliminary testing will begin October 1<sup>st</sup>. After selecting technologies, the target for being 50% online with the technology is 2005, with the other 50% a couple of years later. Selection for a test pilot will be in 2004 for testing in 2005. National Environmental Policy Act (NEPA) work will be done in 2004-2006.
- Part of the C3T process is looking at baseline impacts. The Administration wants the budget processes from now on to be based on the accelerated plan. That baseline will be out late next year. As technologies are selected, they will be put into the baseline.

### ***Agency Perspectives***

Suzanne Dahl, Ecology, said there are two ways to improve throughput to the plant: bring on the second melter sooner and use supplemental technologies. Ecology holds to the Tri-Party Agreement (TPA) date of vitrifying all waste by 2028. They will look at these technologies to see how they perform.

Suzanne outlined Ecology's policy concerns:

- What are the waste forms?
- How will DOE decide which waste goes to glass and which doesn't?
- How will DOE decide how much waste will go to glass? The PMP shows 60-70% of low-level waste going to something other than glass.
- All of these technologies are at a different level of advancement and there is not enough data available now to evaluate these methods. Pilots are needed. The department has so far looked only at permitting issues, not technical ones.

### ***Early Tank Closures***

Joe Cruz, DOE-ORP, noted there is a lot of uncertainty on how to build a credible closure EIS for tanks. The goal is to build a closure EIS and make decisions once and for all. The best thing is to try closing a tank. Ecology is going along in the PMP with starting with tank C106; hopefully, that will provide good data.

Suzanne Dahl said the PMP is a pretty good collection of what Ecology agreed to. No final decisions will be made until it is clear what cleanup needs to be done in 2006 to allow the tank to be closed. Suzanne acknowledged that it is difficult to close things in pieces.

### ***Discussion***

- Does the PMP help clarify the path forward? Once the PMP is finalized, Joe Cruz wants to have as many public meetings as needed for people to be informed and comfortable with the decisions.
- Suzanne Dahl said DOE has decided to proceed as Ecology always thought they should: go through site-wide permit and closure plans, write permit requirements, get public input on the details. Each individual tank closure will require a permit modification allowing public and Board input.
- Has the characterization data necessary to determine what is left been determined? Data quality objectives (DQO's) have been identified. The bigger task is finding what they need to know to do retrieval versus closing, since some initial assumptions were based on little data. Ecology has made it clear to DOE what they need to see.

- Has DOE considered what public involvement will be? DOE wants this to be a very open process. There is a fact sheet available now, but design and characterization is still farther out. There are public involvement requirements in the TPA, and the PMP will have information for those milestones.

### ***Increased Throughput***

The baseline is to process 10% of low-level waste (1100 units or metric tons of sodium) by 2018. That could be accelerated with steam reforming. The baseline for high-level waste is 120 canisters. DOE wants to increase the high-level waste throughput by two to four times with bubblers and a second melter. With the plant currently being built, completion won't happen until 2045. An additional melter could move the date up to 2035, but the 2018 date cannot be met.

There are two factors affecting efficiency: name plate (maximum) capacity and the overall capacity of the melters. There are examples of melters operating at greater efficiency than expected. DOE is looking at alternative melters such as cold crucible melters, but there is no funding to pursue it. Cold crucible melters have a much longer life and can operate at high input. DOE is asking for help with this from the Office of Science and Technology (OST).

Since the West Valley is going down, an autopsy can be done on it to understand fault lines and get better information on the melter's life span. Leaching oxidation or chromium can reduce waste volume and leave less glass.

### ***Discussion***

- Is there a determined push to steam reforming? The data on steam reforming has driven the interest in it, but DOE is always looking at new technologies.
- Why look at alternative melters rather than adding melters? There are international agreements to work with Russia and France, so it makes sense to work with the OST because this project will be about 5% of their budget. The management structure will be through DOE-ORP.

Rudy Carreon, DOE-ORP, identified some problems with bubblers.

- Failure of melt at the top of the melt
- Corrosion and erosion
- Granular attack, material erosion, material stress
- Aluminum blades don't withstand the environment. Different coatings have doubled the life of the bubblers over the past year.

### ***Agency Perspectives***

Suzanne Dahl said Ecology is holding to the course on the vit plant as planned, and can look at other technologies as we go along. The only issues for the Environmental

Protection Agency (EPA) are NEPA issues: tank closure, new treatment plans, alternative technologies, and proposals to leave waste in tanks.

### **Potential Showstoppers**

Joel Eacker, CHG, who is responsible for tank farm projects to support the vit plant, presented the top ten risks to the system. There is a group analyzing the risks of moving waste to double-shell tanks, getting it out, treating, transporting, and storing it. Joel handed out a compilation of individual risk profiles with the corresponding dollar values associated with those risks. These values are determined by multiplying the risk probability times the dollar value to get the risk to the program, either schedule or cost.

The top ten risks are:

1. Contingency. Is there enough of a contingency provided by Congress?
2. Annual funding shortfalls.
3. Readiness Review: having workers trained and the facility tested on time.
4. Timely submittal and disposition of potential changes: preventing impacts of labor availability, changed labor costs, changed working conditions.
5. Integration of CHG's baseline with the vit plant and tank farm baselines.
6. Testing/commissioning incidents (possible shutdowns).
7. Transition to the Waste Treatment Plant operations contractor.
8. Schedule: delayed startup increases overhead costs, etc.
9. CD-3c approval: this is needed to show Congress it should start spending the money.
10. Readiness assessment and startup approval to see that the facility runs.

### ***Discussion***

- How is this used? Each entity has its own risk matrix that works on a real-time basis. This document is the top level of the whole risk picture.
- Aren't the real risks more technical? The technical issues are risks, but the ones listed have a higher dollar impact to the overall project through potential cumulative effects.
- Aligning the baselines is not higher on the list because the money has to align, but so does the supply feed. You have to be able to supply waste for the plant to treat in order to meet TPA milestones.
- Is overall risk to the project the total of adding all these risk values together? Each item carries a probability of happening, and some things are mutually exclusive.
- Doing incremental readiness reviews instead of the whole plant at once could affect costs.
- One concern is that there is a timeline for speeding up the vit plant, but no process for accelerating delivery of feed (i.e. no change in the baseline).

- It is not known at the moment if there is an additional cost associated with putting the Bechtel facility lab into its own building.
- What is the risk of none of the supplemental technologies performing to expectations? Some big uncertainties have been identified, but no analyses have been done yet to determine that risk.
- Was the upgrade of the canister storage building done? Just enough was done for spent fuel, so it has yet to be finished. CHG is going to look at the facility this week to start removing things.

A second handout showed what the tank farms group is doing to get ready for the vit plant. There are demonstration retrievals for single- and double-shell tanks, a new RCRA disposal facility to take low-level waste from the tank facility, and interim storage. Anyone who has questions about it can call for information.

CHG presented a handout on tank farm contract major risks. The technical risks include the following.

Double-shell and single-shell tank integrity. Losing any double-shell tanks increases the risk to the program. The ability to feed the vit plant depends on the tank farm. There has been some testing of tanks recently for wall thickness. There is 2.5 million gallons of emergency capacity in case of tank failure. The retrieval process is monitored to avoid leakage.

Concurrent construction activities. Doing all the double-shell tank upgrades at the same time will require 110 people. That is a relatively small labor force to acquire and train.

Failure of targeted single-shell tank waste retrieval technologies. Technologies are being demonstrated in the cold test facility over the next two years of single-shell tank retrieval.

Paige Knight asked that the committee receive updates when there are changes rather than receiving updates every month.

Todd Wright, Bechtel National, Inc. (BNI), handed out a list of the Waste Treatment Plant's top technology risks. Two new risks are determining the caliber of the canister at melting and high-level waste melter scale-up issues. BNI is analyzing different sizes of melters. The level of glass in the canister has to be determined remotely by a thermal imaging camera.

Two items have been added to the list of risks:

Offgas flammability. Organics in the wastes go to the melter, causing damage. Adding sugar adjusts the redux in the melter and prevents the formation of foam. After adding sugar, tests were run, and the flammability was low. A chemical reactor test is being developed, as are models.

Aluminosilicates. During the process, aluminosilicates form that can leave a coating. This issue is being analyzed.

Programmatic risks remain the same as the list given to the committee in May.

Could there be unforeseen changes in the program at the national level that that could cause a change in direction at Hanford? The answer was no.

### ***Agency Perspectives***

Ecology air permits, toxics, Notice of Completion, and prevention of deterioration will be finalized July 31<sup>st</sup>. Ecology issued authorization to DOE to proceed while public response is finished. The first phase of the dangerous waste permit is scheduled for about September 1<sup>st</sup>. As design goes further, Ecology will review the design package and go into permitting and public comment.

Some of the approximately 50 different design packages may be grouped together. There will be a rolling permit process. The agencies want feedback. One requirement is a 30-day notice before a package goes out. Ecology and BNI would like to simplify that process by give notice once a quarter with a list of packages due out during that quarter, rather than announcing each package. That was agreeable to the committee pending approval by the Public Involvement Committee.

### **Update - Estimate of Completion**

A baseline was issued on May 17<sup>th</sup> showing an increase of \$827 million since the contract was awarded. The contractor believes they can deliver the high-level waste glass facility 18 months early. They plan to realize a cost reduction of \$350 million for a net increase of \$470 million in 2010. This is contract scope work only, not PMP. Some of the reasons for the increase are increased cost of the facility, increased cost of pretreatment, and the stand alone laboratory. The lab was removed from the facility to avoid interference with the treatment plant and to keep the lab from being disrupted by outages at the facility. With changes in the equipment configuration, there was no longer room for the lab.

### ***Discussion***

- When the contract was signed, the agreement was that if DOE paid BNI \$680 million per year, BNI would do the job. DOE is reviewing the documentation now. BNI is contending that some of the increase comes from changes required by DOE. There have been design changes in the pretreatment facility.
- Is the time passing in which DOE must respond? A response letter was sent that neither agreed nor disagreed with the assertions of BNI. There are a lot of unanswered questions and it is unclear what DOE will agree to.



- When will this get a public vetting? Right now, DOE is looking at the numbers and trying to prepare a defensible justification to Congress and Headquarters for the increase. There is no answer for when that information will be available to the public. The history is as follows: last year BNI submitted a \$410 million increase in work that Harry Boston, ORP Manager, didn't want to accept. DOE took away the \$350 million incentive. Harry Boston left and Roy Schepens came in as Manager. The increase was raised to \$517 million. Roy said he didn't want increases. BNI had been working for a year to make the \$410 million go away, but the design process has progressed significantly. The treatment to take sulfates out of waste was eliminated; equipment was put back into the pretreatment facility, changing it to a canyon facility, so more materials are needed. That added \$162 million this year. This is the first bottom-up estimate that DOE has seen since the bid was submitted.
- BNI holds weekly trend meetings where engineers propose changes to enhance the facility and make a determination whether the improvement should be funded out of the \$350 million incentive. DOE has not been in on that process. During the first 18 months, BNI used \$188 million of the contingency for these improvements.
- BNI has a list of pending items that they feel have been imposed on them. As of May 17<sup>th</sup>, those items totaled \$538 million. Eleven of the 51 pending items have been submitted in sufficient detail to negotiate. Out of the 51 items, four or five of them constitute about 80% of the budget increase.
- Roy Schepens wants this process and the numbers to be understandable to everyone. A report is due out this week that will try to find efficiencies and change the baseline accordingly. After deciding how much money can be confidently expected from Congress, DOE will add the rest to the project as a contingency.
- The criteria for accepting or rejecting increases will be the impact on the operations of the plant: technical value, efficiency, and increased capacity. So far, it looks like all but about 10 of the increases are needed. BNI has to provide an estimate and DOE has to go through the change process, going back to Headquarters. When DOE writes up the 2004 budget, they need an idea of what they can accept.
- How can the public accept this increase? This is a \$4 billion project in the preliminary design phase. A project that large needs a very large contingency in the early stages. The probability of coming in at the first estimate on a project of this magnitude is very low. Harry Boston asked for a \$350 million contingency, but was given \$250 million. Today DOE would ask for an even larger contingency. The process has been to add the contingency into the project budget after the fact. This has happened over and over again, making DOE look like a terrible manager. Managers were never permitted to implement DOE rules.
- When ORP submitted the permit applications with changes in them, did they de facto accept the changes and the cost implications of them? Wasn't the time to assess the changes at the time of permit application submission? Peter Furlong, DOE-ORP, said

BNI redid the reconfiguration as part of the baseline update. They did a bottom up cost estimate for the entire project in January. Bill Taylor, DOE-ORP, agreed that the due diligence should have been done a year ago instead of carrying the Fiscal Year 2001 update.

- But the due diligence is the operating and maintenance costs relating to the redesign. Peter Furlong said there are other changes that will increase capacity and save money. When the pretreatment facility was redesigned, DOE went to the BNI trend board and discussed the technology changes. DOE understood the rough order of magnitude of the costs, but the baseline wasn't re-estimated.
- Doesn't the acceleration of commissioning take the costs above the \$680 million per year that BNI is contracted for? BNI has been asked to submit a contract-compliant forecast. They are responding. DOE doesn't expect to get any more than \$680 million from Congress. They are looking for ways to accelerate and still stay on budget by doing things like splitting procurements. Accelerating construction saves money. The accelerated timeline is better than the contract and the TPA.
- Has a life cycle cost analysis been done? Do the plant changes impact operation and maintenance costs? BNI has a process for assessing that. There are teams that are tasked to look for ways to optimize the design to save time and money. DOE does its own independent evaluation. DOE will be sending upper level managers to the BNI trend meetings to interact at that level in order to save time on decision making. There have been DOE observers, but no one there to make decisions.
- Are any of these issues due to a shortage of management at DOE? DOE has been able to cover the work so far. As construction begins on five large facilities, more federal employees or support staff will be needed.

The committee stressed the need for DOE to communicate in a timely way on what the changes are and what the impacts are.

### **Work Plan**

At the July Board meeting, committees were asked to look at their work plans to see that they align with the Board's focus on acceleration for the coming year. There are issues in C3T that fit that description. The committee identified the following as issues that fall under the umbrella of acceleration and align with ORP activities:

- The costs and the baseline of the vit plant
- Getting the vit plant online and holding businesses accountable for doing it
- Understanding and being involved in the closure demonstrations for the tanks
- Treatment technology
- Early closure
- Throughput

Pam Brown said that she cannot be the issue manager for tank closure. After getting started, she realized it is much more technically complex than she anticipated. Another issue manager will be assigned to help Pam.

The meeting adjourned at 4:45 p.m.

### **Handouts**

RPP Top Ten Risks  
Tank Farm Contract Major Risks  
Top Programmatic Risks  
Waste Treatment Plant Top Technology Risks  
CH2M Hill Tank Farm Activities Summary  
Waste Treatment Plant Baseline Update

### **Attendees**

#### **HAB Members and Alternates**

Ken Bracken	Doug Huston	Jeff Luke
Pam Brown	Dave Johnson	Todd Martin
Harold Heacock	Paige Knight	Gordon Rogers
		Leon Swenson

#### **Agency Staff, Contractors and Others**

Rudy Carreon, DOE-ORP	Suzanne Dahl, Ecology	Jim Betts, BNI
Joe Cruz, DOE-ORP		Suzanne Heaston, BNI
Peter Furlong, DOE-ORP		Bill Wagoner, BNI
Bill Hewitt, DOE-ORP		Joel Eacker, CHG
Bill Taylor, DOE-ORP		Lynn Lefkoff, EnviroIssues
Steve Wiegman, DOE-ORP		Linda Grotefendt, EnviroIssues
		Barb Wise, Fluor Hanford
Yvonne Sherman, DOE-RL		Peter Bengston, PNNL
		John Stang, Tri-City Herald
		Al Boldt